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ABSTRACT

This paper presents a proposal for "Perspectives on Professional Knowledge," a course designed to introduce junior-level Syracuse University students to rhetorical and linguistic concepts as tools for the examination of professional knowledge and professional education. The paper briefly describes the course and discusses the relationship of the proposed course to Syracuse's current junior- and senior-level writing courses. The paper then discusses the rationale for the course, noting that the new course will provide an opportunity to develop teaching methods that focus on the specialized problems of literacy in undergraduate professional education. The paper includes an example of a mechanical engineering student who demonstrates the need to read professional literature from a rhetorical perspective. The paper concludes with curricular design principles for the proposed course and a discussion of problems of implementation. (RS)

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CCCC Presentation

Proposal for an Advanced Writing Course

"Perspectives on Professional Knowledge"

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Description of Course

Perspectives on Professional Knowledge is designed for junior-level students enrolled in Syracuse University's undergraduate professional programs, especially management, engineering, and education. The course will also be open to students majoring in economics and the natural sciences—fields offering knowledge directly applicable to professional careers.

The course will introduce rhetorical and linguistic concepts as tools for the examination of professional knowledge and professional education.

After a brief theoretical introduction, students will meet with the instructor to design individual writing and reading assignments, which are intended to complement and extend the work they do in professional courses. In a series of short- to medium-length papers, students will examine the persuasive and social aspects of language in professional literature. Class instruction will deal with specialized functions of language not generally emphasized in courses on technical and professional writing: decision-making, the generation of hypotheses, the application of rules, principles, theories, and axioms, and collection and interpretation of data. Special attention will be paid to the language used to integrate non-verbal symbols, such as mathematical expressions, graphs, diagrams, and tables, into professional arguments. Writing will be complemented by various oral activities: discussion, interview, and class presentations. Students will be expected to make extensive use of primary sources. Library search skills and other information-retrieval techniques will be emphasized.

In addition to close reading of primary sources, students will also examine the profession they are entering at a more general level. The course will take up professional culture, social structure, ethical standards, and pedagogical theory. Students will be asked to reflect on the nature of professional expertise, the goals of particular courses they're taking, and their own progress as learners.

The course is based on case studies of Syracuse University students who majored in mechanical engineering and management information systems.[1] The two studies were written for in-house curriculum development projects and made available for discussion by faculty members interested in the new course.

Staff selection is potentially a sensitive issue. Instructors who teach this course would require specialized training. This course is not designated as a Studio and may not be suited to some teaching methods employed in other Writing Program courses.

Sections of this course might be offered in conjunction with specific majors or degree programs. In such cases, extensive consultation with the partner discipline would be required.

Relationship of the proposed course to WRT 305 and WRT 405

Perspectives on Professional Knowledge is proposed in addition to, rather than as a replacement for, WRT 305 and WRT 405, Syracuse's current junior- and senior-level writing courses. The three courses fulfill different purposes and are aimed at different student populations.

WRT 305 is primarily literary in emphasis. Sections of this course deal with such topics as style, narrative theory, the essay, letter-writing, and art criticism. Because many students from professional programs presently take the course, teachers have made a special effort to make connections with those fields—for example, they ask students to write about the style of professional writing in their major, or apply narrative theory to a professional text, or write an essay about a controversial topic in the profession. Often, though, such assignments leave students unconvinced of the relevance of literary theory to professional knowledge. Sometimes the exercise seems merely perfunctory. Occasionally, students sense they are being asked to criticize professional knowledge without due consideration of its uses or purpose.

If students strongly committed to professional preparation take the proposed course instead of (or in addition to) WRT 305, instructors would feel less pressure to demonstrate the applicability of literary theory to non-literary fields, and some of the current problems would be avoided.

WRT 405, on the other hand, focuses on the writing and culture of the workplace. This orientation precludes close attention to the curricula of professional courses, which WRT 319 is designed to complement. Moreover, because WRT 405 attracts many students from nontechnical fields, including liberal arts majors, it cannot deal systematically with research-oriented technical writing, which WRT 319, with its emphasis on primary sources, will do as a matter of course. In general, WRT 405 focuses on the kinds of reading and writing students will do after they leave school; WRT 319 will address what they are learning while they are in school.

Rationale

The institutional logic of professional education suggests the possibility of a kind of writing instruction which has not been systematically discussed by scholars in composition or implemented in college writing programs.

Professional education differs from liberal education, which provides the intellectual underpinnings for most writing courses, in that it holds out to students what might be called "the promise of employability"—the assurance that they will leave school qualified to enter specific professions or careers. This promise leads to curricular pressures not felt in liberal education, whose advertised benefits are less specific. For employers, accrediting bodies, and even students themselves, the thoroughness and relevance of instruction in professional fields are always on trial.

The promise of employability produces characteristic effects on the curricula and teaching methods in professional programs. Members of professional faculties feel a responsibility to cover all professionally relevant material in the courses they teach, working their way to the end of what is sometimes a very crowded curricular agenda. "Coverage," as this approach is sometimes called, dictates a comparatively rapid pace of instruction and discourages digression, elaboration, and pedagogical experiment.

The function of exams in the system of professional education reinforces this constraint on instruction. In effect, exams guarantee that students are genuinely prepared for the careers they have chosen. To fulfill this role, they must be both comprehensive (covering all the course material) and objective (designed to produce unambiguous answers). In constructing exams, faculty therefore choose questions that elicit predictable patterns of reasoning and avoid those that invite inference or speculation. The experience of taking these exams confirms students' judgment about the intellectual level at which professional courses should be conducted, thus increasing the pressure for pedagogical conformity.

Not surprisingly, these constraints on curriculum and teaching methods dramatically circumscribe the reading and writing students do in professional courses. To help them acquire the minimum requisite level of knowledge, reading assignments have to present specific concepts, rules, terms, and formulas succinctly and unambiguously—information of the kind, and in the form, that can readily be reproduced on an exam and evaluated by the instructor. Most of students' reading is done in textbooks, which admirably fulfill these criteria. When they are assigned other material—original scholarship or other primary sources, for example—students tend to read selectively, focusing on results or conclusions rather than on hypotheses or reasoning. Writing assignments are similarly constrained in length, format, style, subject, and purpose—like exams, they, too, are seen as a guarantor of professional competence and are thus designed to elicit predictable patterns of reasoning.

From the point of view of scholarship in composition, this literacy (way of reading and writing) could be described as arhetorical: that is, it presents language as static, deemphasizing its social aspects and in particular its persuasive dimension. Thus, the process of theory-building is collapsed into statement of theory. Conclusions overshadow arguments. Complex patterns of collaboration and competition in research are set aside in favor of conclusions drawn from the research. The effects of this process vary, depending on the prior knowledge and academic ability of individual students. In general, however, it

tends to discourage independent reading and to make students' writing about professional subjects (at least for a lay audience) flat, laborious, and tiresome to read.

Scholars in composition tend to regard this version of literacy as aberrant and harmful. Their critical attitude can be seen in a number of recent reform projects whose goal is to vary the reading and writing practices of professional courses. In the School of Management at Syracuse, for example, a Writing Certificate program has been designed to give students more extensive and varied writing experience.[2] At the Colorado School of Mines, a sophomore chemical engineering course is being taught in conjunction with a specially-designed humanities course.[3] The two courses combine the study of basic chemical equations with ethical, literary, and historical perspectives on technological development.

Such projects frequently make professional courses more efficient, productive, and enjoyable for both students and faculty, but they rarely result in a thoroughgoing reconceptualization of literacy in a professional field. Reformers are therefore thrown back on more traditional ideas about the relationship between writing courses and professional education.

The oldest and most powerful of these ideas is that writing courses, like humanities courses in general, should be designed to offer students in professional programs a chance to broaden their education. A writing course, like a course in religion or anthropology, is a form of enrichment. Students gain from studying and writing about subjects they wouldn't take up in their professional courses, simply by virtue of the fact that the experience pushes back the bounds imposed by professional education.

Recently some writing courses based on the "broadening" concept have turned to more explicit criticism of social institutions, including the professions. These courses often try to confront students with problems instructors believe will be posed by the professional or expert status that is the general goal of their education. These courses often assume that teachers in professional schools avoid such issues in order to recruit students to unthinking acceptance of professional culture and thus to perpetuate its hierarchical social structure.

A fairly strong dose of this critique has found its way into the subdiscipline of technical and professional writing.[4] In general, though, these courses take a somewhat different tack in trying to resist the constraints of professional education: they shift students' focus to the rhetorical challenges they will face after they leave school. The usual approach for these courses is to ask students to write in a professional role; in giving advice about writing, teachers invoke the needs of a hypothetical real-world audience, thus hoping to recover the dramatic qualities of writing that professional courses have de-emphasized.

The course proposed here represents a different approach to these issues. Its primary assumption is that the version of literacy found in professional programs is not aberrant or necessarily harmful, but rather an apt response to the needs of the students and to the promise of employability. It recognizes that by their very nature, professional courses must present a schematic and highly simplified version of professional knowledge. Reforms notwithstanding, "coverage" will always be the primary concern of faculty in professional programs; rhetorical perspectives will always take a back seat to the kind of knowledge that can be evaluated on exams.

Because the internal logic of professional courses makes sense, at least in a provisional way, writing instructors should be able to work within and complement this educational

system without giving up their own ideas about rhetoric. Issues of argument, interpretation, and meaning—all of which depend on close attention to language—lie in the province of writing teachers. Only a composition course, therefore, can focus directly on the rhetorical dimension of professional knowledge.

If approved, this new course will provide an opportunity to try this complementary approach, to develop teaching methods that focus on specialized problems of literacy in undergraduate professional education, and to make a more extensive study of the role of language in the acquisition of professional knowledge.

Why read professional literature from a rhetorical perspective?

the example of a mechanical engineering student

As an example of the teaching methods to be employed in the proposed course, consider the case of a mechanical engineering student at Syracuse, who was asked to read a sample of professional literature for an undergraduate writing course.

She chose a study in which the researcher, Mohamed Hashish, developed a mathematical model to describe the performance of an abrasive waterjet—a machine tool designed for precise cutting of very hard metals for specialized applications (for example, titanium used in high-performance aircraft).[5]

Hashish begins by reviewing the professional literature on erosion of ductile metals, to ascertain which parameters of the abrasive waterjet's operation would significantly affect cutting performance. He then conducts experiments to find out how changes in these parameters affect the depth of cuts made in various metals. Next, he carries out "visualization experiments." High-speed cameras are set up and the abrasive waterjet is videotaped cutting a sheet of Plexiglas. The result is a series of very precise pictures, showing what happens millisecond by millisecond as the abrasive stream cuts into the Plexiglas. Finally, he develops an equation describing the relationship between the depth of the cut and the various parameters, including water pressure, diameter of the jet, abrasive flow rate, and speed of traverse.

The student, who had already demonstrated considerable gifts as a writer on other assignments, was able to produce a succinct and fairly readable explanation of this much of the study. What she was not able to do was step back from the researcher's specific conclusions and consider the study from a rhetorical perspective. She didn't know how to discuss Hashish's argument. For her, there was nothing to argue. The study was persuasive because it was factual—Hashish laid out very carefully everything he did and all the results he got, and if readers were skeptical, they could reproduce the experiments and compare the results.

This interpretation, of course, was not entirely wrong. It makes sense in terms of the kinds of knowledge she might be expected to retain from this study and to reproduce on an exam. In fact, if the study focused only on the effects of varying parameters on the tool's cutting performance, her reading of it would be unexceptionable.

Where it falls short is in dealing with other aspects of Hashish's project—his review of professional literature, the design of the visualization experiment, and the development of the mathematical model. In each of these areas, Hashish moves beyond quantitative data produced by his own experiments and those of other researchers, extending their conclusions and developing his own through a complex process of deductive reasoning, comparison, and speculation. This process of reasoning is what enables Hashish to draw more general conclusions from his own data and permits application of the mathematical model to situations he himself did not create experimentally.

How much of this reasoning process can an undergraduate student be expected to follow, explain, or evaluate? The answer to this question will vary widely with students' abilities. Parts of the reasoning process, however, are accessible to anyone who can explain the design and conclusions of the study. One obvious example is the way in which Hashish acknowledges the limitations of his method, qualifies his conclusions, and points out areas

for further research and refinement of his model. The model is only an imperfect representation of an abrasive waterjet's actual performance: its rhetorical force derives partly from the precision with which its limitations are described. Students may not be able to evaluate this aspect of Hashish's argument, but they should at least be able to find his simplifying assumptions and other acknowledged limitations, explain how he justifies them, and discuss how they restrict the usefulness of the model.

Other dimensions of reasoning in the study serve purposes that are more or less parallel: to derive the model from other researchers' descriptions of the erosion process and from Hashish's own experimental data. What matters here is not just the specific issues Hashish had to address in constructing this model, but the arguability of models in general and how it affects the way they are applied to real-world problems. The underlying principle here holds true for a number of other professional fields from which the proposed course will draw its enrollment. Mathematical models in engineering succinctly restate verbal propositions that form the basic structure of professional knowledge; similar propositions, and a similar underlying structure of argument and uncertainty, can be found in management, education, and economics.

Why ask students to write about that dimension of knowledge in a writing course?

The object isn't to teach them that argument, uncertainty, and imperfection exist in the realm of professional knowledge—they'll discover that on their own soon enough, if they haven't done so already. Nor is it for them to learn particular arguments and to be able to reconstruct them at some other time or in some other setting—on an exam, for instance.

One might answer the question by simply observing that argument is an important piece of the puzzle of professional knowledge, one often not dealt with systematically in professional curricula. Students don't write about the rhetorical dimension of professional knowledge elsewhere, so why not try in a writing course? This argument, though weak, is not entirely unworthy of consideration. Its merit depends on the degree of difficulty particular students encounter when they try to explain some feature of argument in a professional text. If the project is effortless, presumably the practice it provides is unnecessary, since students could do the same thing at any other time without special instruction. If, however, they encounter fairly serious difficulty, then the project poses a significant problem of professional literacy, and the pedagogy outlined here will appear to have accomplished something useful.

One could, however, argue for this approach without reference to the challenges it poses for particular students. One could observe that, in general, the kind of language used in discussing the rhetorical dimension of theory is more complex and demanding than the language required simply to restate it or apply it to problems. Because the construction of a theory involves progression and takes place over time, students must deal with problems of narrative structure, such as priority, sequence, pace, and verb tense. More complex sentence structures are needed to represent logical interconnections. The indicative mood of verbs ("I did") no longer suffices; writers must draw on the conditional and subjunctive moods ("I would do," "I might have done"). Finally, discussing the construction of models requires language much more precise than that used simply to restate or apply them. The definition of terms and objects of study takes on an importance not found in simple restatement and problem sets.

Does this matter to students?

It ought to. The arguability of models may not turn up in exam questions, but it bears on what models are and to what extent a particular model fits the purpose it's used for.

Skeptics might suggest that the rhetorical features of engineering make a significant difference only at the cutting edge, where the field is unstable, and aren't important in the areas of settled knowledge that represent engineers' usual work. For students, though, scarcely any area of knowledge can be regarded as settled, at least to the extent that it has become second nature to them and need never be questioned. Attention to the rhetorical context of theory highlights their own rhetorical maneuvers as they try to understand, reconstruct, and apply the theory. Language understood as rhetorical is suppler and stronger than language considered to be exact and static. The proposed course will thus introduce a language of learning different from, and possibly complementary to, the kind of language employed in professional classes. The course could be alternatively described simply as a sustained inquiry into the content and purpose of professional education. One way of learning something is to question it—question-asking may not be one's ultimate goal, but it places the thing to be learned in a different perspective.

Perhaps, though, to the question, "Does this matter to students?", one should answer that ultimately it is up to them to ascertain how it matters. The proposed course includes reflective writing, in which students will be encouraged to think through the goals of their education and their progress as learners. An assignment whose relevance to professional study can be called into question provides a perfect opportunity for such reflective writing. To answer the question, "Does this matter?", students have to say something substantial about their own needs and interests, what they get from professional courses, and what they know about themselves as writers and learners.

For the mechanical engineering student, Hashish's modeling study turned out to be a topic well-suited to an undergraduate composition course. She was sufficiently engrossed in the study to spend several weeks writing about it and trying to make sense of it from a rhetorical perspective. The course proposed here didn't exist yet, and the results of her analysis were less edifying than one would expect from a more fully developed rhetorical pedagogy, but her persistence suggests an alternate rationale for the project. She didn't appear to learn as much about rhetoric as one might have hoped, but she had a chance to write extensively about a subject of interest to her and to discuss it with someone—the instructor—who knew nothing at all about abrasive waterjets, and had to have every detail of the machine and the study explained without reference to prior knowledge. Rhetoric aside, that was an ambitious undertaking; it forced the student to recapitulate her own process of learning in a way students rarely have time or reason to do in professional courses. Despite the limited success of the project, it posed a major problem of literacy in professional education, and thus played out the complementary relationship that is the goal for the course described in this proposal.

Curricular design principles for the proposed course

This course is designed to be taught in multiple sections. Versions of it could also be offered in conjunction with specific professional disciplines. The following recommendations to teachers of the course are intended to give it a predictable scope and method, without narrowly prescribing a curriculum or depriving them of the flexibility they need to teach to their own strengths and address the interests of individual students.

- Each student should choose a writing topic in his or her area of professional study. Care should be taken to ensure that topics are intellectually challenging, can sustain students' interest over a period of weeks, and will complement what they learn in other courses.
- Writing assignments should generally be short (5 pages or less), should be designed in sequence to cover different aspects of a single topic, and should apply or illustrate diverse rhetorical concepts.
- Students should not be expected to do original research—writing teachers aren't qualified to direct it, except in their own field (for example, in the case of an English education major).
- Topics for reading and discussion for this class should include highly technical subjects, even if students think they are inappropriate for a writing course. Students should be required to explain scientific and professional concepts to the satisfaction of the instructor. What they can't explain to an attentive lay audience, they can't explain to themselves, and therefore can't claim to understand thoroughly.
- Students should be assigned to give oral presentations, conduct panel discussions, and engage in other oral activities. Because of its public nature, oral interaction creates tension and drama, requires active engagement, and dramatizes rhetorical concepts like ethos and audience.
- As part of their classwork students should be asked to interview members of the professional faculties. Conversing with an expert is an important test of professional language skills; interviews, moreover, can establish or reinforce bonds that both students and professors value.
- Individual conferences with students should be a regular feature of the course. The teaching approach described here is only as good as the questions teachers ask, and it's almost impossible to know how good the questions are except in the presence of the primary respondents.
- Teachers should ask to see students' papers for other courses, and should pay special attention to the reasoning and research that lead up to the paper, even though students may not define these activities as writing.
- In discussion of ethical issues, teachers should be sensitive to students' intellectual goals. Those who consider students' professional ambitions ethically suspect by definition should avoid teaching this course. If one objects in principle to a technology that might help build better bombers, one is unlikely to pay the kind of minute attention the course might require to the construction of Hashish's mathematical model.

- Students should not be expected to act out or write in professional roles. They have sufficient opportunity to do so in professional courses and in the senior-level writing course (WRT 405). In this course, they're writing in their own role as students, with teachers as their main audience.

Problems of Implementation

While this course is simple in concept and easy to adapt to the needs of individual students, it does pose a number of organizational problems which should be addressed before any formal application is made to the Syracuse Faculty Senate.

1. *staffing and compensation*

   Because the course depends on detailed knowledge of reading and writing in professional fields, new teachers will need to spend more time preparing, trouble-shooting, and doing background research. However great their enthusiasm for the new project, they are unlikely to make such a commitment gratis.

2. *supervision*

   Because this course poses unusual intellectual challenge and makes a very specific promise to complement what students are learning in professional fields, it needs to be carefully supervised, to maintain academic standards and to ensure overall goals are clearly articulated.

3. *links to other academic units*

   In principle, this course can be multidisciplinary, though restricted to students from professional programs and from academic majors (like economics and sociology) whose knowledge is directly applicable to the careers students envision. In practice, however, it may work best when taught in conjunction with a specific discipline.

   A version of the course linked to one discipline would have several advantages. A relatively homogeneous enrollment would make it more likely that the whole class could participate in discussions requiring specialized knowledge. Instruction for one student would thus be more easily applicable to others. It would also increase the efficiency of instructor's own learning and research—they could study applications of rhetoric to one field instead of a dozen or more.

   There are, however, some obvious difficulties. First, a linked course would violate the Syracuse Writing Program's long-standing commitment to a multidisciplinary curriculum. Second, it would require a commitment of time and attention from other academic units. Third, it would raise the possibility of the goals of the course becoming blurred and its content subordinated to that of the partner discipline. The last of these difficulties could be addressed by thorough preparation of teachers and careful supervision.

Notes

[1] "Heather and Hard Science" (April 1990) and "Literacy in Professional Education" (April 1991). Available from the author on request. The example discussed later in this proposal (pages 5-7) is based on the former study.

[2] Development of the School of Management Writing Certificate is supported by grants from the Xerox Corporation and the Chancellor's Fund for Innovation. A description of the project is available on request from the Writing Program.

[3] Olds, Barbara M. and Miller, Ronald L. "A Model for Professional Education in the 21st Century: Integrating Humanities and Engineering Through Writing." Presentation to the Conference on College Composition and Communication. (1993)

[4] See, for example, Sauer, Beverly A. "Hoover's Translation of Agricola's *Dere Metallica.*" Presentation to the Conference on College Composition and Communication. (1993)

Sauer presents Agricola's Renaissance treatise on mining, translated by Herbert Hoover, and Hoover's own writing about mine operations, as examples of a characteristically technological approach to problem-solving—an approach which gives priority to rational thought and consequently devalues emotion and human experience. Hoover, as President, Secretary of Commerce, chair of various government commissions, and one of the first graduates of the Stanford School of Engineering, is held up as a representative figure in the modern technological paradigm. Hoover's interest in Agricola is significant: Agricola, writing during the Renaissance, wants to systematize mining operations and argues that the lore of mining is insufficient to ensure commercial viability of an enterprise; a mine operator must also know about surveying (to stake out land claims), law (to defend them in court), and mathematics (to make accurate assessments of the profitability of the venture). In effect, Agricola is doing to traditional miners what the technological paradigm is doing to society as a whole: holding up rationality as an ideal, and discarding emotion and experience. The scarcity of female engineers and scientists, along with Hoover's comments about the comparative efficiency of black and white miners, are held up as evidence that the technological paradigm is a white male construct, leading inevitably to the exploitation of less powerful social groups.

By implication, technical writing courses have a responsibility to persuade students that they must resist the technological paradigm and oppose the exploitation it causes.

[5] Hashish, Mohamed. "A Modeling Study of Metal Cutting With Abrasive Waterjets." *ASME Journal of Engineering Materials and Technology*, Vol. 105, Jan. 1984, pp. 88-100.